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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,857	11/26/2003	Prathyusha K. Salla	132958XX-D/YOD GEMS:0264	9694
7590	11/17/2006		EXAMINER SOLANKI, PARIKHA	
Patrick S. Yoder FLETCHER YODER P.O. Box 692289 Houston, TX 77269-2289			ART UNIT 3737	PAPER NUMBER

DATE MAILED: 11/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/723,857

Applicant(s)

SALLA ET AL.

Examiner

Parikha Solanki

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☒ Claim(s) 5-8, 13-16, 21-24, 29-32 and 37-40 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☒ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Specification*

1. The disclosure is objected to because of the following informalities: on page 1, paragraph 3, the disclosure recites "Gating techniques that use organ motion information to time the acquisition of imaging data are known as prospective gating techniques. Conversely, those that use organ motion information to time the acquisition of imaging data are known as retrospective gating techniques." This recitation suggests that prospective and retrospective gating are identical, and as such the description is contradictory, as it is known that they are two distinct processes. Examiner suggests that Applicant amend paragraph 3 of page 1 of the specification so as to provide clear and accurate definitions for prospective and retrospective gating as they are commonly practiced in the art.

Line 2 of page 3 contains a typographical error. Examiner suggests the phrase "may used" should be replaced with "may be used."

Line 11 of page 15 of the specification contains typographical errors. Examiner suggests the word "date" should be replaced with "data," and the word "equate" should be replaced with "equated."

Appropriate correction is required.

### *Double Patenting*

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

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Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

1. Claims 1-40 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-32 of copending Application No. 10/723,894, in view of Larson (US PG Pubs. No. 2004/0155653). Although the conflicting claims are not identical, they are not patentably distinct from each other. The instant application discloses methods for combined retrospective and prospective gating for cardiac MR imaging, whereas the co-pending application claims systems and methods for retrospective gating only. Larson ('653) teaches that it is advantageous to use both forms of gating when performing cardiac MR imaging in order to further reduce artifact induced by peripheral organ motion, and provides a system and methods for such. It would have been obvious to one of ordinary skill in the art at the time of invention to modify the method of the co-pending application to include steps for prospectively gating the image data to acquire more accurate cardiac motion data, in view of the teachings of Larson ('653). See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993) for pertinent case law.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Claim Objections***

2. Claims 5-8, 13-16, 21-24, 29-32, and 37-40 (Group I) are objected to under 37 CFR 1.75 as being substantial duplicates of claims 1-4, 9-12, 17-20, 25-28 and 33-36 (Group II). The steps and features recited in Group I for reconstructing image data are considered obvious over the embodiments recited in the claims of Group II. It is known in the art that raw MR k-space signal data is not useful unless it is reconstructed into temporal domain data in order to extract pertinent temporal and spatial data for creating an image, and methods for such reconstruction are also well-known in the art. Examiner suggests that Applicant cancel all claims of either Group I or Group II to eliminate duplicate claims from this application. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 101***

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

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4. Claims 1, 5, 9, 13, 17, 21, 25, 29, 33 and 37 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. As set forth in the USPTO Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility, published on 26 October 2005, a method without a tangible, useful and concrete result is considered non-statutory subject matter. Examiner hereby directs Applicant's attention to pages 19-22 of these Guidelines for further explanation of what constitutes a tangible, useful and concrete result.

Claims 1, 5, 9, 13, 17, 21, 25, 29, 33 and 37 recite "a method for imaging an organ" with steps for acquiring and processing data. These steps provide no useful, concrete or tangible result. Examiner suggests that Applicant modify these claims to include one or more steps for planning therapy for the patient being imaged based on the data acquired and processed by the current methods described by these claims. Examiner respectfully reminds Applicant that the mere step of diagnosing disease based on image data will not remedy the statutory deficiencies of these claims.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-8, 17-24, and 33-40 are rejected under 35 U.S.C. 102(e) as being anticipated by Larson et al (US PG Pubs. No. 2004/0155653).

Regarding claims 1-8 and 17-24, Larson ('653) discloses a system and method for MR imaging of the heart and lungs, including steps and components for synchronizing the acquisition of imaging data with motion of a patient by extracting timing information from MR imaging data and non-imaging data, such as EKG data, equivalent to the electrical sensor data disclosed in the instant application (¶ [0014], ¶ [0020], ¶ [0053], ¶ [0063], Figure 6).

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Larson ('653) states that multiple prospective and retrospective gating points may be used to extract image data over a period of periodic motion of the lungs or heart, equivalent to the steps of acquiring and processing the image data as disclosed in the instant application (§ [0019]). Larson ('653) provides steps for reconstructing the image data from raw k-space data (§ [0042]).

Regarding claims 33-40, Larson ('653) discloses that the imaging data is synchronized with motion of the patient, equivalent to compensating for motion as claimed in the instant application (§ [0010]).

Regarding the computer program and MR imaging system of the instant application, Larson ('653) discloses using a conventional MR system to perform the retrospective cardiac image gating method (§ [0053]). It is known that, in the state of the art at the time of invention, a conventional MR system included an imager, data acquisition circuitry for acquiring and processing motion image signals, system control circuitry for operating the imager, an operator workstation for communicating with the system control circuitry, a sensor-based motion measurement system as claimed in the instant application, and computer programs including routines for operating all of the above-noted components.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 9-16 and 25-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larson et al (US PG Pubs. No. 2004/0155653), in view of Rogers et al (US Patent No. 5,477,144).

Larson ('653) discloses all features of the present invention as presented in paragraph 6 of the instant Office Action. Larson ('653) teaches that the image data may be synchronized using data acquired solely for the purpose of timing, but does not explicitly disclose that the timing data is acquired via a non-electrical sensor (§ [0060]).

In the same field of endeavor, Rogers ('144) presents a system and method for reducing image artifacts in MR images synchronized to physiological cycles (Abstract). Specifically, Rogers ('144) teaches that, during image synchronization, the cardiac cycle could be measured

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using produced from a pressure transducer, an acoustic microphone, a piezoelectric crystal transducer, a strain gauge or air flow meters, all of which are equivalent to non-electric sensors as disclosed in the instant application (col. 5 lines 53-65). The non-electrical sensors provided by Rogers ('144) would be simpler and safer to use in an MR imaging environment, as the magnetic fields and pulsed magnetic field gradients used in MR can interfere with the collection of signals from electrical sensors. Larson ('653) specifically teaches that it would be desirable to avoid using external electrical sensors in a hostile MR imaging environment in order to prevent this problem (¶ [0003], ¶ [0013]). In light of this motivation, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the method and system of Larson ('653) to include steps and components for employing non-electrical sensors to acquire image timing data, in view of the teachings of Rogers ('144).

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Epstein et al (US Patent No. 5,997,883), Spraggins et al (US Patent No. 4,961,426), Stergiopoulos et al (US PG Pubs. No. 2004/0102695) and Hedlund et al (US PG Pubs. No. 2002/0156371) teach related methods and systems for acquiring and gating cardiac MR data to correct for organ motion artifact.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Parikha Solanki whose telephone number is 571.272.3248. The examiner can normally be reached on M-F, 8 - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571.272.4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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